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THE TRAIL OF '48



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# THE TRAIL OF '48

# FOREWORD

*Immediately following the discovery of crude oil near Leduc on February 13, 1947 Imperial Oil took steps to secure some preliminary indication whether a substantial reserve might be hoped for in the area. Two widely spaced "step-out" wells, one about 1½ miles south and the other two miles north-east of the discovery well were promptly drilled and when they gave promise of a sizeable producing area a refinery to process the additional supplies of Canadian crude into useful products was projected.*

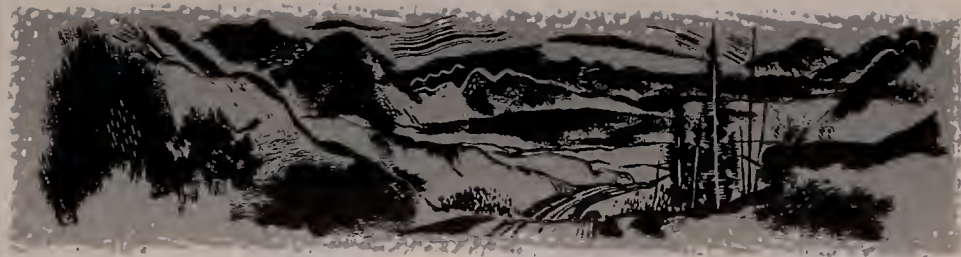
*Shortages of materials and supplies were grim facts that confronted the planners. About three years would have to elapse before a new refinery could be designed, built and put into operation.*

*In the face of this unalterable circumstance the project of moving a refinery from Whitehorse, in the Yukon Territory, to Edmonton was conceived and developed.*

*This booklet tells the story of how, as a result, a modern refinery has gone into operation at Edmonton less than 18 months after the first Leduc well was brought into production.*

*It is a story that Imperial Oil is proud to tell in tribute to the many workers whose ingenuity and resourcefulness have made the development possible.*

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HIS was a gamble in the true tradition of the sourdoughs of half a century ago. The stakes were high, the odds were tough and unpredictable Arctic weather was the joker.

Down north, in the gateway to the back of beyond, a complete, full-scale oil refinery loomed gaunt in idleness against the Yukon sky. Built to fuel the first line of defense for a mechanized war against possible Japanese invaders, the Whitehorse refinery in the spring of 1947 was a plant without a purpose.

Well over a thousand miles to the south, in the heart of Alberta, Imperial Oil's Leduc field was rumbling into productive life. It looked like the strike of the decade and all across the Dominion oil-needy Canadians found heart in the knowledge

that new fountainheads of petroleum had been tapped within their own boundaries. The oil was there, all right; but how to turn it quickly into the products that Canadians needed? It was then that someone suggested the gamble. Could the Whitehorse refinery be moved? Was it physically possible? Would the cost be out of all reason? And would the refinery be suitable for the job to be done?

That was the spark that started a chain of stirring events in the already spectacular saga of the great Northwest. Thirteen hundred miles of man-sized roughneck country for a trail. Seven thousand tons of massive yet intricate equipment for a pack. Did they still breed the kind of men who would pick up a challenge like that?

Drive out to the Edmonton refinery some sunny day—any





# North-West Territories

Watson Lake

Fort Nelson



British Columbia

Fort St. John

Peace River

Alberta

Dawson Creek

Grande Prairie

Edmonton



## The Trail of '48

The 7,000 tons of refinery equipment travelled 1,350 arduous miles - - - from Whitehorse, in huge diesel trucks to Dawson Creek, then on by rail to Edmonton, its final destination.

day—and you can see the answer. The Leduc wells fifteen miles away are supplying the crude and the refinery is pouring out its end products. It's the Whitehorse refinery in a new location; they still breed the kind of men who will pick up such a challenge.

**A**NYWHERE except in Whitehorse you might compare the moving of a refinery to the moving of a mountain and say, "It can't be done". But in Whitehorse they'd already moved a mountain so they knew it could be done. That's the way they made their airfield; bulldozed the top off a mountain, shoved it into the valleys, levelled it off and laid out landing strips. Now they were going to move a refinery.

It's a hundred and eleven miles by narrow-gauge railway from Whitehorse, Yukon Territory, to the sea at Skagway, Alaska. Coastal steamers pick up freight and passengers there and run them down the island-sheltered coast to Vancouver. There, at the Pacific railhead of the transcontinental lines, you can trans-ship to Edmonton. By the time you unload at Edmonton you've handled your material four times and you've come the long way around. That's one way to ship a refinery from Whitehorse to Edmonton.

Here's another. Truck it down the Alaska highway to Dawson Creek, trans-ship there to the railroad and unload at Edmonton. You've saved one complete manhandling of the equipment and you've cut your mileage to a minimum. That's what the engineers in charge of the project decided to do.

It was a big decision. Most of the seven thousand tons of refinery equipment at Whitehorse consisted of seemingly immovable objects, a pipe fitter's nightmare of pipes, tanks, boilers, furnaces, condensers, girders and gigantic towers. Many of the larger units of the mammoth jigsaw couldn't be broken into components but had to be loaded and shipped complete. What could be dismantled into comparatively mobile sections still added up to a staggering welter of bits and pieces.

From the very beginning it was known that the roads and particularly the bridges between Dawson Creek and Edmonton at the southern end of the long haul would not stand the heavy weights that were going to come down from the north. That meant using the railroad for the final lap of the journey. But from Whitehorse down to Dawson Creek there wasn't any railroad—just the highway. It had been built for the hard usage of wartime traffic and had been kept in excellent repair by Canadian Army engineers, but it would still be touch and go. In a hard freeze-up, yes, the road would stand almost any load. In mild weather? Not so good.

The plan, then, was to begin dismantling at Whitehorse as soon as possible and to start off by sending down the lighter loads during the early winter. Later on the big stuff would go down.

**S**O far, so good. Now, who was equipped with the men and machines to tackle the job? It would take the best of both before it was finished. It did; it took them and it shook them.

Down in Los Angeles the W. M. Barnes Company was operating a big fleet of dinosaur-like diesel trucks that were just about the biggest carriers on anybody's road. The company had a name for doing good, fast work where heavy loads were involved and, fortunately, it was ready to take on the Whitehorse-Dawson Creek trek immediately. A contract with Barnes was signed as soon as possible after Imperial Oil had completed purchase of the refinery from United States war surplus goods for one million dollars. The handling contract involved dismantling at Whitehorse, trucking to Dawson Creek and re-assembly at Edmonton. At each end Imperial Oil engineers supervised the work. On the road the Barnes men, with Canadian drivers, had the job—and the highway—to themselves.

The Los Angeles contractors opened field offices at Edmonton early in the fall. Meanwhile, eight of their mighty trucks

were on the road up from sunny California. Before the first snow fell in Northern Alberta more trucks were on the job and nearly three hundred Canadian workmen, spread out in a pattern that stretched from Edmonton almost to the Arctic Circle, were hard at work. Half the crew worked at preparing the Edmonton site for the refinery's new home. About another hundred men had the difficult task of dissecting the refinery and allotting the pieces for movable loads. The remaining fifty men were tooling their trucks up and down the tortuous Alaska Highway or standing by as troubleshooters at relay stations along the way. As a problem in logistics the Whitehorse-Edmonton move could be compared to many a major wartime transport operation. And, just like any wartime movement of material, this one depended, finally, on the efficient working of a highly detailed, closely timed general plan.

Ideally, the refinery would come apart bit by bit at Whitehorse, move in a continuous stream down the highway and then be put back together bit by bit at Edmonton. If things went well there would be no layoffs after the first truck reached Edmonton; from then on more truckloads would arrive on schedule, always giving the southern crew something to be going on with. Fantastically, the ideal was well nigh attained, even after the grim joker that was Arctic weather turned up its face. Surprisingly, winter's blow, when it struck, was not the



conventional one. No storm was big enough to isolate the Northwest. No heavy and continuous cold came to freeze men and rolling stock in their tracks. Rather, the weather produced a reverse twist; it wasn't cold enough. Unusually mild days and nights during the early winter months kept the long roadbed from freezing hard enough and deep enough to provide a continually safe surface for the big diesels and their bigger loads. Some of the trucks, even empty, weighed as much as twenty tons. Loaded to their allowable maximum they would weigh more than twice as much.

**F**ORTUNATELY the over-all plan was flexible enough to provide for such emergencies. The alternative carriers were pressed into service. In all, three large shipments went out to Skagway over the Whitepass and Yukon railroad, down the coast in the CPR steamer Nootka and from Vancouver to Edmonton by rail. Activity on the Edmonton site never flagged once it had begun.

A major part of the responsibility of the engineers in charge of the whole operation was to make sure that the refinery could be put together as easily as possible and without undue delay once the pieces arrived and were unloaded at Edmonton. It was no ordinary jigsaw puzzle; and, above all, it was no game.

Millions of dollars and a country-wide oil need were involved.

Several ingenious methods were used to help expedite re-assembly at Edmonton. First of all, exteriors of all buildings were photographed before dismantling began and wall sections in the pictures were numbered clearly. Painters, working from the marked photographic prints, marked corresponding numbers on the wall sections as they came down. Much of the structural steel had to be dissected by blow-torch before it could be handled at all. Each piece, as it was cut, received its number, the identifying mark that would enable it to rejoin its fellows without delay and in its proper place. Some tanks, towers and other units whose complicated construction would make the task of taking them apart and putting them back together practically



impossible were transported intact. Only the largest of them—those that couldn't possibly be moved in one piece—were broken down.

ALONG about the end of November the Arctic Winter made its power felt again. By now it was cold in Whitehorse—really cold. Zero was a long way off, and in the wrong direction. Men could work on the high, bare networks of steel only if they were bundled in the warmest clothing. That in itself was enough of a handicap because no high climber, no matter how skilled and daring he may be, can perform his tasks with the consummate agility demanded by his trade if he has his movements restricted by the bulk and weight of all those extras. Adding to the difficulty, moreover, was the fact that the Whitehorse periods of daylight shrank rapidly until, on the shortest day of the year, there was barely five and a half hours that could be called “day”. That set strict limits on the riggers’ hours of work. If it’s dangerous in daylight, it’s plain foolhardy to try it in the dark. Safety of the men takes first consideration, no matter how important the job.

Somehow, in spite of the shrill winds and goading snow flurries that spun without warning out of the barren lands’ glowering skies, the take-down crew at Whitehorse kept up a workmanlike pace. So well synchronized was the entire operation that often enough a crane would pick its load out of the very air and deposit it on one of the broad diesel-powered backs that would bear





it down the treacherous thousand miles of ice-paved highway. Often enough, too, when unfriendly weather interfered with trucking schedules, the hundred acre refinery area at Whitehorse became littered with waiting loads.

BUT, day in and day out, throughout the winter, trucks were on the road and the loads kept moving. The staccato clatter of a huge diesel exhaust would bounce its echoes off the mountains surrounding the town of Whitehorse and two more drivers with their dual charge of straining machine and loaded dead weight would be off on the Trail of '48. Barely out of the refinery area the truck would slow to a crawl as it faced up to Two Mile Hill that leads out of the Lewes River Valley and is the first short lap on the nine-hundred-and-nineteen mile push to Dawson Creek. Once on top, the steady grind would begin. "Keep moving" was the rule. While one man drove, his mate could sleep—if his nerves would let him—in the perambulating, one-man bunk house that was built on behind each tractor's cab.

The driver on duty had his hands full all the way. There's no such thing as enjoying the scenery when you're driving twenty tons of truck and a heavier load over an ice-surfaced, gravelly road in the midst of a Yukon winter. You drive her every minute. Or else . . .

And the cab of a big diesel is no place for a Sunday driver. Four pairs of driving wheels respond when you give her the gun. An instrument panel



reminiscent of that of a multi-engined bomber stares bleakly at you from the dashboard. And you have your choice of something up to twenty-one forward speeds every time you put your hand to the gear levers. Behind you a dead mass waits for a chance to play tricks on you, seems to possess a malicious will that constantly counters your own. When you want to start, the inertia of your load seems to concentrate on your own shoulders; once you're moving, the momentum of that same load is a straining, creaking, almost unmanageable force, primed to commit destruction—your destruction. Nerves? You can't afford nerves.

ALL day and all night the big trucks checked off the miles. Sometimes, too, they'd have to rely on an extra truck or

even two to render pusher service for a long, slow climb. Then the icy surface of the road would find its match in the icy skill of a trained team. Gently meshing, slowly creeping, always inching upwards, two crews would combine hands and eyes to do the job. Helpers walking on the road beside their drivers, hands waving in a signal jargon of their own. Drivers sensing proper changes, synchronizing minds and actions with a special brand of rough-and-ready telepathy. Mostly, they made it.

If they couldn't; if a load plunged loose from its moorings or if a wheel skidded into the ditch, extra help was needed right away. In every cab, along with axe, matches and blankets, a telephone hand-set was standard equipment. It was the work of a minute to hook on to the Canadian National Telegraph line that paralleled the highway and to call the nearest relay station. If you followed standing orders, you would have built





a fire even before you called for help. If you didn't build your fire first you might not get another chance. A man's fingers aren't much good even for lighting matches after they've been exposed to thirty-below-zero winds for a few minutes.

**S**ECONDS after receiving an S.O.S. from a stranded truck the telegraph operator at the CNT repeating station would have messages out for the highway expediter who continually prowled his section of the road, ready to size up any troublesome situation and arrange for whatever help might be needed. Often it would be an Army maintenance camp that would come to the rescue with men and heavy equipment. Smoothly as the whole job ran, there were plenty of times when disaster lurked in the

scrub spruce along the highway border—and was averted only by prompt and willing co-operation of the sort that does honour to the oldest frontier tradition.

A special and rather freakish problem arose during the first few weeks of the trucking program. Somehow, probably from loads of reclaimed lumber that had previously been trucked down the highway from dismantled buildings, the highway had become littered with nails. Punctures by the dozen plagued the lives of drivers until after the first good snow fall; a dozen flats per trip, in fact, was average for a while and one unlucky driver chalked up a total of thirty-one in a single trek from Whitehorse to Dawson Creek and back again. In desperation engineers rigged up a huge electro-magnet of the type seen on provincial highways and fitted it to a truck. Before it could make its maiden trip, however, snow came to blanket highway and nails alike.



WEATHER troubles seemed to be over, as far as the trucking operation was concerned, once winter got a good, firm grip on the Canadian Northwest and put down a solid roadbed, but some of the very toughest hauls were still ahead. The biggest and heaviest loads, saved till the last, were completely inhuman in their demands on both men and trucks. Originally, a fifty hour schedule for the one-way trip had been set up. One driving team actually made the round trip in just three days but throughout most of the winter, drivers had their work cut out for them even to come close to the schedule. Toward the end, when the biggest loads were on the road, individual schedules went by the boards; one load, a section of the largest refinery tower, was on the road—or in the ditch beside it—for five and a half weeks. That's understandable when you realize that the tower section was long enough to require two trailers in tandem to carry it and often needed two pushers to help it up the hills. The understandable thing, perhaps, is that the tower ever reached Edmonton at all.

Standing at Whitehorse, the huge tower reared its head a hundred and forty-six feet above the ground; during the three years it stood, it became a standard landmark for the Whitehorse townspeople. When the day came to lower it to the ground



many of the local folk were on hand to watch the job and cheer the riggers who accomplished it without a hitch. Before it could be shifted, two mammoth gin poles—engineering and construction feats in themselves—had to be fabricated and erected alongside the tower. The poles were made by welding together old bridge girders borrowed from the Canadian Army. Ninety-six feet high and supported by a spider web of guy cables they flanked the tower and, with more cables attached to lugs on the tower's sides, they steadied it while winches lifted it vertically off its base. When the tower hung free its bottom was pulled

away and the restraining cables were slacked off until the unit lay flat on the ground. Once there it was cut in half and then it was the truckers' headache until it reached Dawson Creek.

By the time the last big loads were on the road the odds in Imperial Oil's gamble against time and the elements had reversed their original position. A few more cold winds tried their bluster; and a few more accidental delays kept anyone from discounting "time" as a contender in the struggle; but a favourable finish to the fight was well within view. Late in May, with the last of the equipment on site in Edmonton and with seven

hundred men busy at the rebuilding job, the gamble was won. And the record was impressive.

From the very beginning it was realized that the total cost of buying, dismantling, transporting and rebuilding the Whitehorse refinery would equal the price of a brand new refinery built from scratch in Edmonton. Not money but time was the major stake in the contest. It was estimated that the building of an all-new plant would take approximately three years from the time its need was established—well on into 1950. It was estimated at the same time—perhaps "hoped" is the better word—that the moving job, including take-down time and reassembly, would take about half as long. Actually it took half as long, less a month. The Edmonton refinery processed its first crude from the Leduc field just seventeen months after the discovery well came in.

The end of the Trail of '48—the highway moving job—actually marks the beginning of a still bigger adventure, a manufacturing program which, in combination with the assured production of the adjacent Leduc field, will have far-reaching effects on the economy of the Dominion as a whole as well as on that of the immediate Edmonton area.

Leduc, with its known reserve of 200,000,000 barrels of crude and its as yet unknown additional potentialities, represents the first reversal in ten years of Canada's declining production



trend. The field is already established as the country's most important domestic source of crude oil. Its proven area covers approximately 20,000 acres and, at the most recent count, it contained something like eighty-five completed wells. More than half of these had been drilled for Imperial. Under the restricted production quotas which engineers feel will give the best assurance of maximum yield, individual well production varies between one hundred and one hundred and fifty barrels a day. At these rates, and with the number of wells growing up from zero within the single calendar year, 1947's production from Leduc was a mere drop in the bucket of Canada's demand. Yet that same production represented a worthwhile saving in the number of dollars sent out of the country for foreign crude oil purchases and, of course, it gives tangible reason to look forward to still greater savings in the immediate future. The over-all value to Canada in having new sources of oil and oil products in this time of world-wide demand and world-wide need may easily be understood.

**L**OCALLY, too, the benefits that have already begun and are yet to come are many. The owners of mineral rights in the

Leduc field receive a twelve-and-one-half per cent. royalty on all oil produced—or one barrel in eight. As the largest holder of mineral rights the province of Alberta receives much of this money and this benefits all the people of Alberta. A good deal of royalty money goes to the bank accounts of private owners of mineral rights. There are also the increased purchases of all kinds of supplies and the increased payrolls; in 1948 alone Imperial will spend some \$54,000,000 in Alberta. These things create additional wealth and spending power—they mean new money in circulation, the kind of money that helps everyone directly or indirectly.

The new refinery at Edmonton is also making a substantial contribution to the general welfare. In its construction, it provided much temporary work; when operations are completed it will provide about three hundred permanent jobs. While some of these jobs demand personnel already highly trained and experienced in refinery operation, many will be filled by men and women from the surrounding district. It is expected that the "all out" phase of operations will be reached by the end of the year. By that time the pipe line from Leduc, which now ends at Nisku twelve miles south of the city, will have been extended to the tanks in the refinery yard. Storage tanks at Edmonton will handle close to seven hundred thousand barrels of crude and products.





Like any other oil refinery, the new unit at Edmonton is actually a manufacturing plant; it takes in crude oil, virtually useless in its natural state, and processes it into such finished products as gasoline, kerosene, tractor and diesel fuels and other essentials to daily living in the modern age. Even now the crude distillation plant at Edmonton is in operation, turning out Esso gasoline, diesel fuel and bunker fuel.

Distillation is the basic move in processing crude oil. Complicated in practice, it may still be described simply as the process of applying heat to a liquid to cause evaporation and then condensing the resulting vapors by cooling. The lighter parts of the crude—those with the lowest boiling points—are recovered first; others follow in their turn. The procession follows this order: first the gasoline vapors, then kerosenes, diesel and heating oils, lubricants, heavy fuel oils, and, finally, asphalt. Even this can be reduced by further boiling until only coke is left. These are the “fractions” of petroleum, the primary products of the refinery.

Finished goods are manufactured from these near-basic materials by further processing. This may involve redistillation, chemical treatment, filtering through clay or Fullers earth. Or it may consist of solvent extraction, solvent dewaxing and other processes. Or it may call for two or a dozen or more actions simultaneously or in series. Always, the steps are leading toward something useful to society. In all, more than five hundred finished products may emerge from the maze of towers, tanks, tubes and furnaces that combine to make a modern refinery.

The new refinery at Edmonton is well suited to handle the particular form of crude that the nearby Leduc field produces. Occupying, for the present, only about one hundred of the three hundred and sixty acres that have been allotted to it, it is capable of expanding as need arises.

**P**ERHAPS that day will come soon—certain additions are being considered—but the Edmonton refinery already has its unique aspects. It is highly unusual for this country, or any other, in that most of its equipment is fully enclosed—not just the pumps and control house as is the case with most refineries. It was constructed originally in such a way that both equipment and operating personnel could withstand the Whitehorse

winters and it has been reconstructed to the same pattern.

Its other unique feature, one that is not likely to be duplicated for a long time, is its amazing travelling record. Even before the Trail of '48 got under way the Edmonton refinery had been christened "the most travelled plant in the world". That was because its original war-born components had been gathered up in Corpus Christi, Texas; Pinedale, California; Hamilton, Ontario; and from two thousand suppliers throughout the United States. Today, with an additional trek of thirteen hundred arduous, icy miles from Whitehorse to Edmonton to its credit, it may well be considered a suitably symbolic monument to modern business enterprise and the ideal of service; for the \$7,000,000 gamble which brought it successfully over the Trail of '48 was undertaken to provide—at a lower price—needed products a year and a half sooner than would have been possible in any other way.



THIS BOOKLET WAS PREPARED BY IMPERIAL OIL LTD. AS A SOUVENIR OF THE OPENING OF THE EDMONTON REFINERY JULY 17, 1948. THE ILLUSTRATIONS ARE FROM DRAWINGS MADE BY R. YORK WILSON, A.R.C.A., P.O.S.A., FROM HIS SKETCHES PAINTED IN THE YUKON.





**B45849**